IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appellant	:	Zachary J. Mason
Appl. No.	:	10/684,313
Filed	:	October 13, 2003
For	:	PREDICTIVE ANALYSIS OF BROWSE ACTIVITY DATA OF USERS OF A DATABASE ACCESS SYSTEM IN WHICH ITEMS ARE ARRANGED IN A HIERARCHY
Examiner	:	Dangelino N. Gortayo

Group Art Unit: 2168

REPLY BRIEF

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This Reply Brief is responsive to the Examiner's Answer bearing a notification date of December 13, 2007, and supplements the arguments made in Appellant's Appeal Brief. Appellant will address the Examiner's responses under headings that identify the respective claims to which the responses pertain.

102(e) Rejection of Claims 11-14

In the Appeal Brief, Appellant argued that the anticipation rejection of Claim 11 is improper because, among other reasons, Ford does not disclose "identifying each ancestor node of the selected item within the browse tree." In response, the Examiner's Answer cites to Ford at column 20, lines 11-21, and arguing that "[t]he search query can be reasonably interpreted to be a selection event to provide a user with a specified item, and the top level categories [of Ford] are interpreted to be the ancestor nodes from which items belong to." (See Examiner's Answer at 12-13.) The Examiner's Answer further states that "the limitation is interpreted by the examiner as identifying the groups from which a selected item belongs to, as determined by the search query, interpreted as a selection event." (*Id.* at 13.)

Appellant respectfully submits that the interpretation of the claim limitation presented in the Examiner's Answer is not supported by the plain and ordinary meaning of the language of the claim limitation, or by the disclosure in the patent specification. The concept of a browse tree and the concept of nodes within a browse tree, are each well understood to persons of ordinary skill in the art. Those meanings are followed by the pending application in Figure 1 and in the written description relating to Figure 1. The specification states, for example:

> Figure 1 illustrates a browse tree 100 in which the items of an electronic catalog are arranged within categories and subcategories.
>
> * * *
>
> In the example illustrated in Figure 1, the browse tree 100 consists of five category nodes C1-C5 and nine item nodes I1-I9. Typically, a much greater number of category and item nodes are provided (e.g., hundreds or thousands of category nodes and millions of item nodes). In the illustrated embodiment, the browse tree 100 is in the form of a directed acyclic graph, in which a child node may have multiple parent nodes. The browse tree 100 may alternately be a pure tree structure in which each child node can have only one immediate parent node, or any other suitable organizational structure. The items need not all fall at the same level of the browse tree, for example, some items may be closer to the root node than others.
>
> The lowest-level nodes, or "leaf nodes," of the browse tree 100 represent individual items, and the other nodes represent categories and subcategories in which the items are organized.
>
> (*See* Specification at ¶¶ 16-18.)

The interpretation of "each ancestor node" provided in the Examiner's Answer is inconsistent with this disclosure in the patent specification. The interpretation is inconsistent at least because (1) it defines ancestor nodes in terms of the results from a search query, which is inconsistent with the disclosed browse tree 100, which exists (and defines the ancestor nodes for a given item) independently of a search query; and (2) it limits ancestor nodes to the "top level categories" in Ford, in effect reinterpreting "each ancestor node" as only the "top" category node, and ignoring the various categories and subcategories between the item and the top category (e.g., elements C2 through C5 in Figure 1).

In the Appeal Brief, Appellant additionally argued that the rejection of Claim 11 is improper because Ford does not disclose the limitation: "dividing said total amount of credit by the number of ancestor nodes of the selected item to determine an amount of credit per ancestor to be distributed for the selection event." In response, the Examiner's Answer points to Table IV and column 22, lines 50-57 in Ford, which describe how (1) a total score for a top level category is generated by summing individual scores for several separate items within the top level category, and dividing the sum by the number of separate items in the top level category. (*See* Examiner's Answer at 13-14.) Even if the interpretation of "ancestor node" provided in the Examiner's Answer is assumed (which Appellant contests), the disclosure in Table IV and column 22 does not support the Examiner's interpretation of this claim limitation. First, the plain language of the claim requires dividing a total amount of credit by a number of ancestor nodes for a particular item. Table IV and column 22 of Ford disclose dividing a total popularity score by a number of different items (e.g., 3 items for Software, 2 items for Flowers & Gifts, and 3 items for Packaged Travel). Similarly, the "total credit" in the claim limitation at issue is associated with one particular item. Table IV and column 22 of Ford disclose a summed popularity score generated from a number of different items (e.g., a summed score of 90 for the 3 Software items, a summed score of 70 for the 2 Flowers & Gifts items, and a summed score of 66 for the 3 Packaged Travel items).

In the Appeal Brief, Appellant additionally argued that the rejection of Claim 11 is improper because Ford does not disclose the limitation: "assigning said amount of credit per ancestor to the ancestor nodes of the selected item within the browse tree." In response, the Examiner's Answer points to Ford at column 21, lines 57-63, and at column 18, lines 37-56. (*See* Examiner's Answer at 14-15.) The cited portions of Ford disclose methods for prioritizing top level categories based on cumulative Popularity Scores. (*See* Ford at Fig. 8.) As discussed in the Appeal Brief, the Ford methods result from a user conducting a search, and not from a user engaged in a selection event. Indeed, the methods in Ford do not distribute or allocate credit, but instead generate search results based on historical selection events.

103(a) Rejection of Claims 1-10 and Claims 15-16

In the Appeal Brief, Appellant argued that the obviousness rejection of Claims 1 and 15 are improper because, among other reasons, the combination of Ortega in view of Herz does not teach or suggest "evaluating differences between the individual user history scores and the collective user history scores to generate a relative preference profile for the user, wherein the relative preference profile comprises relative preference scores for specific item categories, said relative preference scores reflecting a degree to which the user's predicted affinity for a category differs from the predicted affinity of the user population for that category." In response, the Examiner's Answer cites to Herz at column 20, lines 25-37, at column 21, lines 36-49, and at column 25, lines 18-35. (*See* Examiner's Answer at 16-17.) These disclosures in Herz will now be addressed in turn.

Herz at Col. 20, Lines 25-37.

This portion of Herz is within a section entitled "Filtering: Determining Topical Interest Through Similarity." (*See* Herz at col. 18, line 28.) As discussed at length in the Appeal Brief, this section applies for "target objects" for which the user has had no opportunity to evaluate. As such, no relevance feedback (e.g., selection or click-through data) exists, and the system of Herz estimates the user's interest by calculating the sum of two theoretical quantities, *q*, the "intrinsic quality" of the object and *f*, the "topical interest" of the user in the object. (Herz at col. 18, ll. 49-55.) The Herz system estimates *f* for the unevaluated target object by interpolating from the *f* values determined for other target objects that have been evaluated (i.e. for which relevance feedback exists) weighted by the similarity between the unevaluated object and the evaluated objects. (Herz at col. 19, line 18 – col. 20, line 55; Figure 12 at steps **1204-1205**.) Furthermore, Herz's estimation of an *f* value for a particular user for an unevaluated target object relies on relevance feedback from all users, not just the particular user of interest. (*Id.* at col. 19, lines 18-42.)

The excerpt in Herz at col. 20, lines 25-37 discusses details of the "smoothing technique" used to conduct the estimation described above. It does not disclose evaluating the difference between the relevance feedback for a particular user for the target object and the relevance feedback from a population of users for that target object.

Herz at Col. 21, Lines 36-49.

This portion of Herz is within a section entitled "Filtering: Adjusting Weights and Residue Feedback." (*See* Herz at col. 21, line 35.) This section provides additional details of the "smoothing technique" used to conduct the estimation discussed above and described in more detail in the Appeal Brief. Indeed, the excerpt at col. 21, lines 36-49 expressly refers to the need to measure a "distance" between (U,X) and (V,Y), referring to a measure of similarity between a first user, U, associated with a first target object X, and a second user, V, and a second target object, Y. This is merely additional discussion about the details of how to estimate *f* for an unevaluated target object by interpolating from the *f* values determined for other target objects that have been evaluated (e.g., objects X and Y) for which relevance feedback exists (which is not the target object of interest) as determined for other users (e.g., users U and V) who are not the particular user of interest. This excerpt does not disclose evaluating the difference between the relevance feedback for a particular user for the target object and the relevance feedback from a population of users for that target object.

Herz at Col. 25, lines 18-35.

This portion of Herz is within a section entitled "Searching for Target Objects." (*See* Herz at col. 25, line 17.) This section discloses a refinement process whereby a hierarchical cluster tree of target objects may be generated based on similarity to a "target profile" P. This refinement is not pertinent to the methods in the pending patent application, for which the target object is known. It is relevant to the Herz techniques because of the need to identify similar objects in order to do the interpolation discussed above (and discussed at length in the Appeal Brief).

The Examiner's Answer states that the passage in Herz at col. 25, lines 18-35 contradicts the appellant's position that Herz does not disclose comparing a user's history score for a particular object to a collective user's history score for that object. (*See* Examiner's Answer at 17.). In so asserting, it appears that the Examiner's Answer is interpreting the search profile P with a history score for a user of interest for the target object of interest. Appellant respectfully submits this is an improper reading of the passage. The target profile P represents a profile for an object for which there is no history data. Indeed, the Herz methods do not use clusters for objects for which history data exists. Instead, for target objects that have been evaluated by the user, Herz teaches the use of "relevance feedback," which assesses the user's interest based on

"active" and "passive" feedback from the user. In "active" feedback, the user evaluates the object and explicitly indicates his or her interest in that object (e.g., by rating it on a numerical scale). (Herz at col. 17, ll. 39-43.) In "passive" feedback, the system of Herz infers the user's interest from the user's behavior (e.g., by viewing the object on a web page). (Herz at col. 17, ll. 43-58.) Through the use of this active and/or passive relevance feedback, the system of Herz directly determines the user's interest in the evaluated objects, and there is no need for interpolation based on similarity, and likewise no need for object clustering based on similarity.

In the Appeal Brief, Appellant argued that no proper reason had been identified for combining the teachings of Ortega and Herz. The Examiner's Answer contests this position. (*See* Examiner's Answer at 18-19.) In particular, the Examiner's Answer asserts the existence of a motivation to combine since "Herz's method of finding the difference between user preferences and the preference of other user's in the system to find preferable data can be incorporated into Ortega's method of identifying data nodes based on historical data collected of users to provide a user with more specific data preferable to a user, since utilizing data from other users can help give the user preferred matches with less intensive amounts of time and work required." (*Id.* at 18-19.)

Appellant respectfully disagrees that a proper motivation to combine the two references has been identified. Ortega and Herz each teach an approach for how to handle historical data for a target object from an individual and from a population of users. The Ortega approach is to (1) assess the popularity of the object to the individual user, (2) assess the popularity of the object to the population of users; and (3) combine the two popularities to determine a total popularity for the object for the particular user. The Herz approach is to assess the popularity of the object to the individual user, ignoring the popularity of the object to the population of users. The Herz approach further includes a very sophisticated and numerically demanding interpolation approach to estimate the popularity of objects for which the user has never encountered. The Examiner's Answer does not provide a proper motivation for combining a demanding interpolation approach applicable to objects never encountered by the user with the Ortega approach, which applies to objects already encountered by the user. Furthermore, it is apparent that the Herz approach is numerically demanding, and that it would not result in "less intensive amounts of time and work" than the Ortega approach, as asserted in the Examiner's Answer. (*Id.* at 19.)

Conclusion

In view of the foregoing, and for the reasons set forth in the Appeal Brief, the rejections of Claims 1-16 are improper and should be reversed.

Respectfully submitted,

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